REQUEST FOR PROPOSAL E-RATE 2006

PURPOSE OF THE RFP

Burke County School System is evaluating the feasibility of installing additional Internal Connections in multiple sights thru-out the Burke County School System. This RFP will request quotes for LAN upgrades, Wireless LAN, and Maintenance agreements for each site. The purpose of this document is to request a proposal for building and maintaining this data network based on the criteria outlined in this package. We also expect each respondent to demonstrate its uniqueness in fulfilling this request. After review of your proposal, we should know why your company is the best choice for this project.

1. GENERAL BID INSTRUCTIONS

1.0 Standard's and Codes

The Burke County School System is most interested in a network that will conform to established communications standards, electrical, fire, safety, and building codes. It will be the sole responsibility of the vendor or vendors to compile with all federal, state, and local codes. The vendor or vendors will also adhering to the most stringent of the standards or codes.

TIA/EIA-568-B.2-1: Commercial Building Telecommunications Cabling Standard - Part 2: Balanced Twisted Pair Components - Addendum 1 Transmission Performance Specifications for 4-pqir 100 Ohm Category 6 Cabling

TIA/EIA-568-B.3: Optic Fiber Cabling Components Standard

TIA/EIA-568-B.3-1: Optic Fiber Cabling Components Standard - Addendum 1 Transmission Performance Specifications for 50/125um Optic Fiber Cables

TIA/EIA-569-A: Commercial Building Standard for Telecommunications Pathways and Spaces

TIA/EIA-569-A-1: Commercial Building Standard for Telecommunications Pathways and Spaces, Addendum 1

TIA/EIA-569-A-7: Commercial Building Standard for Telecommunications Pathways and Spaces, Addendum 7 - Cable Trays and Wire lines

TIA/EIA-606-A: Administration Standard for Commercial Telecommunications Infrastructure

J-STD-607-A: Commercial Building Grounding and Bonding Requirements for Telecommunications

BICSI TDMM: Telecommunications Distribution Methods Manual

NFPA-70: 2002 National Electrical Code

Article 250 - Grounding
Article 300 - Wiring Methods
Article 310 - Conductors for General Wiring
Article 388 - Surface Nonmetallic Raceway
Article 392 - Cable Trays
Article 800 - Communications Circuits

NAFPA-75: Standard for the Protection of Electronic Computer/Data Processing Equipment

NFPA-101: Life Safety Code

NFPA-221: Standard for Fire Walls and Fire Barrier Walls

NFPA-297: Guide on Principles and Practices for Telecommunications Systems

FCC Part 15: Radiated Emission Limits, revised 1998

1.1 QUALITY ASSURANCE

The current data requirements of BCBOE that would be supported by the network are principally switched 10/100BaseT Ethernet with a Gigabit fiber backbone, capable of one Gigabit over a 62.5/125um fiber backbone and all servers running over 1000BaseT Switched Ethernet ports. In addition, because of the relatively large cost of such a project, BCBOE desires a network that will be capable of satisfying its communications needs for a minimum of five years. Including but not limited to, the possibility of Switched 1000BaseT Ethernet over 100 Ohm UTP copper to the desktop, 10 Gigabit 50/125um Laser optimized fiber optic backbone, FDDI network or other, undetermined, technologies such as voice/data, video or security applications.

1.2 DESCRIPTION OF PROJECT

BCBOE requires that all proposals address a turnkey network. A turnkey network is defined as providing all Servers, network configuration for Pc's and servers as well as connectivity between individual terminals and the file servers, and includes all materials, installation labor, electronics, documentation and training.

1.3 DESIGN REQUIREMENTS (Architecture/Topology)

a. The system must be based on open distribution architecture so that existing equipment and facilities as well as future equipment from multiple vendors can be supported by the proposed system.

b. Unless otherwise specified, a star or distributed star topology is recommended in the design of the distribution system. Closets must house the main electronics and racks.

c. The distribution system design must allow for user administration of the communication system, thereby providing easy station rearrangement.

d. The vendor must have the following qualifications to be considered for this project.
    1. Molex Certified Installer or Hubbell Certified Installer
    2. Hubbell Premise Wiring Certified Installer
    3. Cisco Wireless

Burke County School System is requesting quotes on the data network installation or upgrade of four School sites, and one Support Sites. The LANS will consist of Category 6 plenum cable and Laser Optimized 50/125um fiber optic, with pathway support via cable tray, j-hooks, and surface mounted race way. Additionally, BCBOE would like to upgrade the existing electronics to Switched 10/100BaseT Ethernet to the desktop with gigabit backbones in these 5 sites and UPS for all IDF at these sites. BCBOE would also require data network maintenance for all of these sites as well.

1.2.1 LAN

1.2.1.1 School Sites Drop Requirements (four)

Each site will require six student, and two teacher data drops. One student drop should place near the television outlet. Each site shall contain three thirty-two data drop labs. Each office, conference room, teachers work room, coaches office, environmental control room, media center offices, cafeteria offices, serving lines, and each stage location shall have at least two data drops. There shall be at least ten locations for network printers and copy machines. These shall have two data drops each.

1.2.1.2 Offices, Labs, & Media Centers Requirements

The labs at each site shall contain one thirty-two data drops. Each office, conference room, teachers work room, coaches office, environmental control room, media center offices, cafeteria offices, serving lines, and each stage location shall have at least two data drops and one voice drop. There shall be at least three locations for network printers and copy machines. These shall have two data drops each.

1.2.1.3 Dial-up Networking (one)

BCBOE is requesting quotes on the dial-up network installation or upgrade of one Support Sites. Currently BCBOE has four (4) 28.8 dial-up modems for dial-up networking and would like to upgrade the existing electronics or replace them with eight(8)56K modems and router.

1.2.1.4 Backbone Requirements

Each site will require a twelve-strand 50/125um ***Laser Optimized*** Fiber Optic backbone between the MDF and each IDF location. All the backbone termination equipment shall be rack mounted. No wall mounted backbone termination hardware in

the MDF or the IDF will be allowed. The backbone topology shall be that of a star, no other topology will be allowed.

1.2.1.5 MDF Requirements

Each MDF shall include two seven-foot floor mount cabinets. There shall be a horizontal management panel with cover mounted above and below each patch panel and each network switch. Each patch panel will also require a rear cable manager. Install one rack mounted power strip on each rack. There will be a minimum of one rack mounted UPS, sized to handle the load served for a minimum of thirty minutes. This unit will be also supplied with an Ethernet network card and software for remote interface capability. Provide two rack mounted shelves twenty-one inches deep, two seventeen inches deep, and one keyboard drawer shelf with mouse pad. There shall be a ladder rack system provided to dress the incoming cables from the ceiling to the floor rack. This ladder rack shall be a minimum of eighteen inches in size. No Flex-tray or Snake-tray type products shall be used for this purpose. All of the MDF rack equipment shall be BLACK in color. There shall not be any floor or wall mounted cabinets used in the MDF locations.

1.2.1.6 IDF Requirements

Each IDF shall include one seven-foot floor rack with side vertical management panels with covers. Were there is no lockable room available for the IDF location, a wall mounted cabinet with a minimum size of forty eight inches tall and a usable deep of twenty five inches will be used. There shall be a horizontal management panel with cover mounted above and below each patch panel and each network switch. Each patch panel will also require a rear cable manager. Install one rack mounted power strip on each rack. There will be a minimum of one rack mounted UPS, sized to handle the load served for a minimum of thirty minutes. This unit will be also supplied with an Ethernet network card and software for remote interface capability. There shall be a ladder rack system provided to dress the incoming cables from the ceiling to the floor rack. This ladder rack shall be a minimum of eighteen inches in size. No Flex-tray or Snake-tray type products shall be used for this purpose. When a cabinet has to be installed, conduits will be installed from the cabinets to the ceiling level to conceal the cables. The wall-mounted cabinet if required shall not be installed in a hallway location. All of the IDF rack equipment shall be black in color. If a wall mounted cabinet is to be used, it is to be mounted on a ¾" painted backboard.

1.2.1.11 Fire Rated Walls

All firewalls and smoke walls penetrated will be properly sleeved and replaced back to original fire or smoke rating. Any other wall that is to be penetrated shall have sleeves and bushings installed in them.

1.2.1.12 Grounding

A complete grounding system will be installed with all racks, cabinets, ladder rack, conduit, and cable tray bonded to the main electrical service ground. A grounding conductor will be installed from the MDF to each IDF.

1.2.1.13 Surface Raceway and Power Poles

Each student location (six cables) will be installed in surface mounted two-section raceway on one wall and each set of two jacks will be placed on three-foot centers. The instructor location (two cables) will be installed in single section raceway on opposite wall. The labs will have 32 data drops each. The configuration in the labs will be five per location with the Panduit T70 series raceway. In addition, four power/data poles shall be quoted for each lab. In the classrooms where a wall box is not available, the specified raceway above shall be provided. Provide enough hanging boxes for two duplex receptacles on each of a double data outlet in the T70 raceway. Provide the power poles with at least two power outlets installed. The power poles shall be brushed aluminum no painted steel poles are allowed. ***Power is not erate eligible & will be installed by others.***

1.2.1.14 Outlets and Plates

The outlets to be installed will be Category 6 rated, orange in color for data and ivory in color for voice jacks. The plates will be Ivory in color with clear covered label strips.

1.2.1.15 Copper Panels and Blocks

The data cables will punch down on eight position eight conductor category 6 rated patch panels. The voice cables, horizontal and backbone will punch down on rack mounted 110 blocks. The backbone cable to the Demarc will be punched down on a 66 block. The patch panels will be sized for all the cables installed plus twenty-five percent spare.

1.2.1.16 Fiber Panels and Connectors

The fiber optic patch panel in the MDF will be sized large enough to handle all the fibers from the IDF locations plus twenty-five percent spare. The fiber optic cable will be connected by using SC type epoxy connectors.

1.2.1.17 Horizontal Cable Requirements

The horizontal cable used will be **Hitachi** category 6, plenum rated cable. This cable will be used for data and voice alike.

1.2.1.18 NETWORK SWITCHES

The network switches to be provided and installed will be Cisco 4000 series at the MDF and Cisco 3750 at each IDF series. These will be installed at each site. The backbone linkage will be over gigabit fiber modules.

1.2.1.19 Labeling, Testing, Asbuilts

Each and cable installed on this project will be labeled. Each cable installed on this project will be tested. There will be Asbuilts drawn of each site using Auto-Cad and presented to the BCBOE. The Test results and drawings will be in printed from and on disk.

1.3 Wireless LAN

BCBOE is requesting quotes for a wireless LAN at BCHS, BCMS and SGA. The proposed solution shall include Cisco 1200 G series wireless AP's and Air space controllers.

1.4 Basic Network Maintenance

BCBOE will require vendor provided Maintenance support for all schools in the system. BCBOE is requesting on-sight 2 days per month. The support shall include installation, maintenance, changes to eligible services and equipment under contract, adds moves and changes. Engineer shall be certified in Cisco Wireless, and hold a CCNA & CCDA.

1.5 Cisco Smartnet Maintenance

BCBOE would like to include the cost for continuation of the Smartnet maintenance for all Cisco equipment in the Burke County School System.

1.6 Campus Fiber Network

BCBOE would like to extend the BCHS, BCMS LANs via a 12 strand outdoor rated fiber cable. The fiber shall be installed in a 2 inch conduit w/ junction boxes. The connection shall begin and end at each MDF. Also included shall be the correct Cisco fiber modules to complete the connection at 1000Mb.

1.7 Server Maintenance

BCBOE will require vendor provided Maintenance support for the Servers and all eligible network equipment for all schools in the system. BCBOE is requesting on-sight a minimum of 50 days for the year. The support shall include all server maintenance. Parts that are not covered under warranty shall not be included. Engineer shall be Novell and Microsoft certified.

2. TERMS AND CONDITIONS OF REQUEST FOR PROPOSAL

2.0 RESPONSE SUBMISSION

Responses to the RFP must be submitted in sealed packages and delivered to BCBOE on or before **February 2, 2006.** BCBOE will open the bids at their discretion and evaluate them to determine the successful vendor. It is the sole responsibility of the respondents to ensure that their responses arrive in a timely manner. BCBOE reserves the right to reject any or all bids. The contractor must submit *two (2)* copies of the response along with proposed product information sheets.

2.1 COSTS ASSOCIATED WITH PREPARATION OF CONTRACTORS RESPONSE

BCBOE will not be liable for any cost incurred by the Contractor in preparing responses to this RFP or negotiations associated with award of a contract.

2.2 SUBCONTRACTORS

Should a Contractor use subcontractors for portions of the work, BCBOE reserves the right to reject any subcontractor without explanation or recourse by the Contractor or subcontractor. The identity of the said sub contractor shall be presented in the bid response for review by the BCBOE.

2.3 INTERPRETATIONS AND ADDITIONAL INFORMATION

Any interpretation, correction, or change of the RFP will be made by **ADDENDUM**. Interpretation, corrections, or changes to the RFP made in any other manner will not be binding, and the Contractor shall not rely upon such interpretations, corrections, or changes. Changes or corrections will be issued by BCBOE. Addenda will be mailed or delivered to all who are known bidders. Addenda will be issued as expeditiously as possible (if necessary by FAX, followed up by original documents). ***It is the responsibility of the Contractor to determine all addenda have been received.*** It is the responsibility of all respondents to contact BCBOE prior to submitting a response to the RFP to ascertain if any addenda have been issued, and to obtain any addenda, execute them, and return addenda with the response to the RFP.

2.4 SUBSTITUTIONS

There will be no substitutions on this project. The BCBOE has a base of the products listed in this RFP and is familiar with these products.

2.5 QUESTIONS

Questions regarding this RFP must be made in writing up to five (5) days prior to the Bid Opening. Responses received after that date will not be acknowledged or responded to. Responses to all questions received in proper time frames will be answered in writing and distributed to all known bidders.

2.6 PROPOSAL BINDING PERIOD

Prices quoted in the Contractor's response for all labor and materials will remain in effect for a period of at least *ninety (90)* business days from the issuance date of the Contractor's response.

2.7 OMISSIONS

Omissions in the proposal of any provision herein described shall not be construed as to relieve the Contractor of any responsibility or obligation requisite to the complete and satisfactory delivery, operation, and support of any and all equipment or services.

2.8 GUARANTEES

a. Unless otherwise specified, the contractor and manufacturer shall guarantee the proposed network cabling, materials, workmanship and that the network at the time of installation shall meet the attenuation - to - cross talk ratio (ACR), attenuation and near-end cross talk (NEXT) specifications for a period of ***Twenty-five years*** from the date of acceptance. Network Switches shall be guaranteed by the manufacturer for the ***life*** of the product. Network Servers shall be guaranteed by the manufacturer for a period of at least ***Three years.***

b. During the guarantee period the contractor shall repair or replace, at his own expense, materials, equipment or workmanship in which defects may develop including damage to other work resulting, and shall also provide free service for all equipment and systems involved in the contract during this guarantee period. Final payment shall not relieve the contractor of these obligations.

c. Guarantees and warranties by the respective equipment manufactures shall also be subject to the terms and time limits defined in these specifications.

2.8 CERTIFICATION:

a. The entire cable plant must be tested and certified in compliance with the ANSI/IEEE 802.3 and EIA/TIA-568-B.2-1 1000BaseT specification (category 6)

b. Each node test should include the patch panel, patch cord, device jack, and cable.

c. All test results must be printed and show the following results:

1) Impedance (TDR)
2) Cable length
3) Attenuation
4) Near end Cross Talk (NEXT)
5) Line Mapping
6) DC Ohms
7) Attenuation-to-Cross Talk ratio.

d. Contractor must be a **MOLEX or HUBBELL PREMISE NETWORKS Certified Installer & show proof therof.**

e. Contractor must have a BISCI certified RCDD on staff and show proof thereof.

f. Contractor will be responsible for all local and state permits (if applicable).

g. Contractor must be licensed in the State of Georgia and show proof of a low voltage certification and being in the low voltage data communication trade for a minimum of five years.

h. Contractor must have a minimum of three sites using this type of open distribution 100BaseT topology with 500 or more nodes installed and provide

contact names and telephone numbers.

i. Contractor must be insured with the following minimum rates:
   1) General Liability - $2,000,000
   2) Automobile Liability - $1,000,000
   3) Worker's Compensation - $1,000,000

j. The contractor must provide a **25-year Application Assurance Warranty** by the contractor and by the **manufacturer (Molex or Hubbell)** of the products used in this project guaranteeing the network will perform at speeds in excess of 100mgbs for the next 20 years. **(Equivalent Products will not be accepted)**

Note: Copies of the above Contractors qualifications must be submitted with bid package.

2.9 PAYMENTS

Payments will be made only at satisfactory completion of job and after inspection and approval by BCBOE.

2.10 BID FORM

All responses must be submitted in the following format:

1. Contractors Qualifications
2. Overview of proposed Data Network
3. Overview of proposed Electronics
4. Overview of proposed Basic Maintenance
5. Overview of proposed Cisco Wireless LAN
6. Overview of proposed Cisco Smartnet Maintenance
7. Overview of proposed Campus Fiber Network

Pricing Summary
   a. Total cost of Data Network
   b. Total cost of Electronics
   c. Total cost of Basic Maintenance
   d. Total Cost of Wireless LAN
   e. Total Cost of Cisco Smartnet
   f. Total cost of Campus Fiber Network
   g. Total Cost of project

7. Materials List
   a. Include description and quantities

THE BCBOE RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS AND TO WAIVE TECHNICALITIES AND INFORMALITIES.

2.11 BID AWARD

BCBOE will make the award of the year 2006 E-rate contract based on the criteria listed below.

Factor	Weight

Price	30%
Prior experience	25%
Personnel qualifications	20%
Management capability	15%
Environmental objectives	10%
Total	100%

3.1 MATERIALS

a. Acceptable materials and manufacturers are listed below. Submittal shall consist of catalog pages with items marked, specification sections and paragraphs referenced. Samples of cables, connectors, and termination boxes, shall be required to be submitted for approval prior to installation, shall be EIA/TIA ETL verified, and UL certified.

b. Manufacturer's cable markings shall consist of manufacturer's name, cable type/catalog No., 2002 NFPA type code compliance, and the 2002 NEC code compliance and shall be EIA/TIA ETL verified and UL certified.

c. Make submittal for all supplied materials as included in the scope of this work:

3.2 OPTICAL FIBER and ACCESSORIES

a. All fiber optic cable shall be plenum rated and conform to type ***OFNP***. Type ***OFNR*** shall not be used. Type ***OFNP*** shall be stamped on plenum rated cable. All fiber cable shall be in full compliance with Bellcore TRTSY-000409.

b. Each optical fiber cable shall have a maximum installation tensile load rating of at least 500 pounds.

c. All fiber optic strands and composite cables shall be capable of withstanding a minimum bend radius of 9 inches.

d. There shall be no conducting component in the cable; steel strength members are not acceptable.

e. The operating temperature range shall be between -20 to +70 degrees centigrade.

f. All optical fiber cable purchased shall be factory certified per reel. The certification shall instrument readings from an optical OTDR noting the cable lengths, db loss per meter, fiber index of refraction and laser wavelength. An OTDR test data sheet shall be provided as per attached with photograph or graphical output showing display, cable reflect-meter trace and all its settings.

g. A single fiber optic cable shall be run with required multiple fibers as

noted on drawing to form a point to point cable run between the space termination locations. Multiple cables will not be allowed.

h. Each fiber in the multiple fiber cables shall be identified individually by color codes or numbering.

i. Fiber optic composite fan-out cable construction: Each fiber shall be coated and encased in a thermoplastic buffer, encased with a strength member, encased with a PVC jacket forming a subunit. Each composite cable with more than two fiber subunits shall have a center strength unit with the subunits surrounding the strength unit, encasing the subunits and center strength unit with a strength member. The outer jacket shall conform to ***PLENUM*** rated specifications (as required to conform to code). Each composite cable with two fiber strands shall be constructed as above less the center strength member.

j. Each fiber shall be a 50/125um ***Laser Optimized*** multimode fiber and shall have the following minimum optical performances guaranteed across the entire temperature range.

Wavelengths		850 nm	1300 nm
Attenuation	Range	3.5 db/km	1.5 db/km
Bandwidth	Range	2000 MHZ-Km	500 MHZ-km

k. Cable markings: The cable shall be marked with a color that is in contrast to the color of the cable sheathing. The markings shall include the manufactures name, cable Type, and note the NFPA type code compliance and the NEC code compliance.

Acceptable Manufacture.
Hitachi

3.2.1 **OPTICAL FIBER CONNECTORS and PATCH CORDS:**

a. Each multimode fiber end shall be terminated with an SC type Ceramic Ferrule connectors, field installable.

b. SC connectors shall be installed as per manufacture recommendations. Fiber strand shall be crimped onto connector. Connector end face shall be polished perpendicular and smooth to achieve a minimum loss of 0.3 db per mated pair and a maximum loss of 0.5 db per mated pair.

c. Ceramic SC connector couplings to be used in termination connector panel modules.

Acceptable manufacture
Molex Premise Networks, INC AFR-00011
Hubbell Premise INC.

d. Jumper cables shall be duplex cables with pre-assembled SC/LC connectors. Jumper cable lengths shall be no less than 3 feet, but may be as long as needed.

Acceptable manufacture
Molex Premise Networks, INC. 91.LC.521.00100

Hubbell Premise, Inc.

3.2.2 FIBER OPTIC CABINETS, PANELS AND ASSOCIATED HARDWARE:

a. Rack mountable interconnect center, shall contain two compartments adjoined in the center with the connector panel separating the compartments. The connector panel shall contain the appropriate amount of SC type connector sleeves with protective caps on each side of the sleeve. The inside compartment shall contain a cable organizer to allow coiling of excess cable. Each compartment shall have a door with a latch to secure the door closed. Both doors on the inside shall have all labels affixed for documenting cable numbers and routing information. Enough labels shall be provided to accommodate all cables on each side.

Acceptable Manufacture:
Molex Premise Networks, INC.
Hubbell Premise, INC.

b. Fiber optic adaptor plates shall contain a maximum of three dual SC couplings. These couplings shall be beige in color. When install the fiber ports that are not in use the couplers shall be capped. Provide one extra adaptor plate in each MDF fiber optic panel for future use.

Acceptable Manufacture:
Molex Premise Networks, INC.
Hubbell Premise, INC.

c. Fiber optic blank plates shall installed in the fiber optic panel spaces that adaptor panels are not installed.

Acceptable Manufacture:
Molex Premise Networks, INC.
Hubbell Premise, INC.

3.2.3 INSTALLATION OF FIBER OPTICAL CABLE:

a. The fiber optic cable shall not be spliced. Cable runs shall be from beginning to end.

b. Precautions shall be taken during the installation to ensure the cable is not tangled or crushed. Replacement of the cable will be at the contractors expense if the cable does not pass the acceptance test. Minimum cable pulling radius shall be no less than the manufactures specifications. Pull cable with kellum type pulling grips and swivel designed for installing fiber.

c. The cable shall be racked or strapped to rack hangers and other devices to provide support. Twenty feet (20' ft) slack (service loop) shall be left in entry and exit of cable trays so the cable is not binding on the entry and exit of these devices: cable shall be loose and limp.

d. Cable termination routing in the Fiber Optic Termination Center: Route the cable along the cable trays to the appropriate distribution frame. Bring the cable from the bottom of the rack mounted fiber panel, secure cable to panel, and strip the casing. Leave twenty-four inches of loose fiber for

routing in fiber panel, install the SC connectors. Neatly tie all cables to bundles as they enter the distribution frame and into the Fiber Termination storage cabinet. Follow all manufacturers installation instructions. Attach a #6 ground wire to the building ground.

e. Prepare individual cables for field installable SC connectors as per connector manufactures instructions. Install SC connectors as per manufactures recommended procedures. Connector end face shall be polished perpendicular and smooth to achieve a minimum loss of 0.3 db per mated pair and a maximum loss of 0.5 db per mated pair. Use clean dust caps when completed. Do not remove dust cap until immediately prior to insertion. When inserted into a connector sleeve, a cap shall be installed on the open side of the connector. Use lint-free Isopropyl alcohol dampened cloth to thoroughly wipe the connector face and ferrule.

f. Install fibers paired 1-2,3-4,5-6 top down in connector panels. Label fan-out cables accordingly: Labels shall include destination panel and fiber strand ID in the MDF, in the IDF the label shall include the source MDF and fiber strand.

g. Properly label each fiber on each end of the installation and include the length of the cable.

h. Provide factory assembled 3 meter jumpers for each pair of fiber strands used to connect to the active equipment.

i. The Contractor shall be held responsible for any damage done to any areas from work under this contract at no additional cost to the Owner. Repair or replacements shall be with materials of equal or better quality, in the same manner as originally installed.

3.2.4 FIBER OPTIC TESTING:

a. Upon completion of this portion of the work, furnish all equipment and personnel to conduct tests to secure approval of the installation from all agencies having jurisdiction.

b. Attenuation testing, shall be performed on each fiber strand per EIA-FOTP-171. A factory assembled 3-meter SC jumpers as per cable specifications shall be used as the reference jumper. Initial calibration shall consist of three jumpers connected together with the optical power source on one end and the optical power meter on the other. The optical power source and meter shall be manufactured by the same manufactures and shall be considered a test set. Wavelengths to be measured 850 nm and 1300 nm. Obtain a new reference calibration each day. Remove the center jumper. Connect the optical power source jumper to the fiber strand to be tested and connect the optical meter jumper to the other end of the fiber strand to be tested. The attenuation (db) is equal to the Reference calibration meter reading minus the measured optical meter reading.

c. An Attenuation data sheet shall be prepared for all cable noting, the test results of each fiber strand per cable as per the attached Attenuation test data sheet.

d. Submit the Attenuation data sheets for approval and acceptance of cable installation. Contractor will be responsible for materials and labor for replacing optical system that fails to comply with specifications.

e. Connectors shall have no more than a minimum loss of 0.3 db per-mated pair and a maximum loss of 1.0 db per mated pair. Cable attenuation shall not exceed 2% more than the attenuation of the cable on the reel as certified at the factory.

3.3 HORIZONTAL WIRE SPECIFICATIONS

This section deals with the cable from the communications outlet to the patch panel in the telecommunications equipment room. These cables shall be category 6 plenum LAN Cable which is four pair 23 AWG 100 ohm Unshielded Twisted Pair (UTP) with spline divider. Each four pair cable shall be placed in a home run fashion from the classroom to the telecommunications closet. There shall be no intermediate splices or cross connects in these cables.

The classroom termination of each cable will be on certified category 6 data jacks. The telecommunication closet termination will be on certified category 6 Patch Panels.

The characteristics of the horizontal cable is as follows:

a. Category 6 cable shall be used, which is composed of 23 AWG bare solid copper conductors insulated with a ***plenum*** rated material with spline divider. No type of shield is required in the sheath.

b. Each sheath shall contain 4 unshielded copper pairs. Each pair shall have a different twist ratio per foot ranging from 12 to 24 twists per foot. The four pairs shall be separated by a plastic spline.

Acceptable Manufacturer
Draka Category 6 Plenum

3.3.1 PATCH PANEL SPECIFICATIONS

This section is relevant to the termination hardware located in the telecommunications equipment room. This termination hardware will provide the capability to be able to patch connections between ports on the LAN hardware and horizontal cables to classrooms. The termination hardware will be co-located on 19-inch racks with the LAN Switches. The configuration of the patch panels should be in an arrangement that minimizes patch cords lengths. The exact configuration should be worked out between the LAN administrators and the installation contractor. The horizontal cables to the classroom will be directly connected to 110 insulation displacement hardware associated with each jack on the patch panel. The jacks on the patch panel shall be wired to the EIA 568B wiring standard. The patch panel must be a certified 24/48 port Category 6 distribution system component.

Acceptable Manufacturer:
Molex Premise Networks, INC. PID-00079 or PID-00080
Hubbell Premise INC.

3.3.2 JACK AND OUTLET SPECIFICATIONS

a. The jacks used must fit properly in the outlet openings of the outlet faceplate. The jacks used must also conform to the following parameters: In a properly installed 100 ohm UTP wiring arrangement, the jacks used must be capable of supporting LAN data rates of up to 250 Mbps at 250Mhz in accordance with the standards of EIA/TIA. The wiring arrangement of the jack must conform to the EIA/TIA 568-B.2-1 Draft 11 standard.

The jack shall possess the following characteristics:

1. The eight (8) position / eight (8) conductor jack should be capable of supporting the previously defined data rates as well as voice and video.

2. Utilization of 110-type insulation displacement hardware for horizontal wire attachment and acceptance of 22 or 24 AWG conductors.

3. The jack wires must consist of 50 micro-inch lubricated gold plating over 100 micro-inch nickel under plating.

4. The data jack must be the category 6 certified Jack. Color shall be orange.

5. The voice jack must be the category 6 certified Jack. Color shall be ivory.

Acceptable Manufacturer

Molex Premise Networks, INC.	KSJ00013-05
Hubbell Premise INC.	

b. The instructional outlets will be of the S-Video type that connects to UTP cabling.

Acceptable Manufacturer

Molex Premise Networks, INC.	MSY00007-05
Hubbell Premise INC.	

3.3.2 PLATES

Only one color shall be used throughout the project. Only flush mount type plates are to be used on this project (unless otherwise noted on the drawings). The faceplate must attach to a panduit single gang electrical outlet box. Provide a six-port plate at the student location and a three-port plate at each other locations. The faceplate shall have a label slot covered with a clear plastic label holder. All unused ports shall be filled with flush mount blanks.

Acceptable Manufacturer:
Molex Premise Networks, INC.
Hubbell Premise INC.

3.3.3 STATION JACK INSTALLATION -- FLUSH MOUNT:

Station jacks shall be installed in electrical outlet boxes on the wall as

specified on the drawings. The boxes must be secured in the wall so that no movement occurs during normal installation and use. The jack and wall plate must each be secured to the box by metal screws. The jack/receptacle shall be positioned vertically on the wall (not sideways).

3.3.4 PATCH CABLES (WIRE CLOSETS):

CATEGORY 6 - 3' FOOT: RJ-45-TO-RJ-45: Patch cords shall be pre-assembled with 4-pair cable & RJ-45 connectors. They shall have RJ-45 connectors on both ends with strain relief. They must meet category 6 cable specifications.

Acceptable Manufacturers
Molex Premise Networks, INC. 3' Ft PCD-00050
Hubbell Premise, INC.

3.3.5 PATCH CABLES (CLASSROOM/LAB LOCATIONS):

CATEGORY 6 - 10' FOOT: RJ-45-TO-RJ-45: Jumper cables shall be pre-assembled with 4-pair cable & RJ-45 connectors. They shall have RJ-45 connectors on both ends with strain relief. They shall meet category 6 cable specifications.

Acceptable Manufacturer
Molex Premise Networks, INC. 10' Ft PCD-00054
Hubbell Premise, INC.

3.3.6 CABLE INSTALLATION:

a. The length of each station cable shall not exceed 295 feet.

b. Must maintain 8-twists per inch per twisted-pair cable at the wall box to the jack and at the station cable end to the patch panel. Do not strip back the cable jacket any more than necessary to punch the cables down (maximum 2" inches) at either location.

c. All 110 connections shall be installed using a 110 punch down tool and all terminations shall be trimmed flush with connector blocks. All 110 caps shall be installed securely to make a tight connection.

d. Leave enough cable (approximately 1 foot at the each classroom & 10 feet at the equipment rack) to allow for a service loop.

e. Cables shall not be tie wrapped to electrical or gas conduit or a water pipe.

f. D-rings will be provided and mounted (by contractor) to route the station cables at the backboard locations (& in chase locations as designated on the drawings).

g. Enough cable slack will be provided to neatly route the station cable through the "D" rings to the appropriate 110-type patch panel.

h. No communication or data circuit shall be run in the same conduit or raceway with power conductor except where the raceway is separated by a divider.

i. The cable shall not be compressed, crimped, crushed, or stretched.

j. The cable jacket shall not be cut or damaged in any way which would expose the inside wires.

k. Protection shall be provided against sharp edges or possible damage caused by work done near the cable.

l. Cable routing shall follow the dictates of the design while avoiding locations of high RFI/EMI radiation of adverse environmental conditions.

m. Tag each end of all cables as specified in the Standard Labeling Scheme.

n. Surface boxes and raceway will be required in every classroom/lab and office as indicated on the drawings.

3.4 SURFACE RACEWAY

This section covers a surface nonmetallic raceway system used for branch circuit wiring or data network, voice, video, and other low-voltage cabling. The nonmetallic raceway system shall consist of raceway, appropriate fittings, and accessories to complete installation per electrical drawings.

3.4.1 Classification and Use.

Surface nonmetallic raceway is to be utilized in dry interior locations only as covered in Article 352 part B of the National Electrical Code, as adopted by the National Fire Protection Association and as approved by the American National Standards Institute. The Panduit LDP Raceway System is listed by Underwriter's Laboratories under File No. E95425.

3.4.2 SINGLE SECTION RACEWAY

a. The raceway shall be a one-piece design. Total width shall be 1.51" by 0.86" deep with an approximate wall thickness of .055". The raceway shall be available in 6', 8' and 10' lengths.

b. The raceway shall have an integral hinge attaching the cover to the base. The raceway shall have tamper resistant characteristics inherit with the design of the latch. The raceway shall be manufactured of rigid PVC compound. The raceway shall have a smooth texture, and be available in electrical ivory.

Acceptable Manufacturers
Panduit Corp. LD5EI16-A-1-1/4 Surface Raceway

3.4.2.1 FITTINGS

A full complement of fittings must be available including but not limited to flat, internal and external elbows, divided tees and entrance fittings, couplers, and end

caps. The fittings shall provide a means for connecting to the raceway and shall be capable of maintaining a 1" minimum cable bend radius. Applicable fittings shall be of either cover only design (for low voltage cabling only), or base and cover design in order to maintain complete enclosure, and to eliminate mitering. The fittings shall be manufactured from a rigid PVC (or ABS/PC) compound. The fittings shall have a matte texture and be available in electrical ivory match the raceway. They shall overlap the raceway to hide uneven cuts.

Acceptable Manufacturers

Panduit Corp.	CF5EI-E Splice Cover
	RAF5EI-E Flat 90
	DCF5EI-E Ceiling Adaptor

3.4.2.2 BOXES

Junction boxes shall be available for mounting standard devices. The junction boxes shall be available in deep versions. The faceplates shall allow for terminating of standard electrical devices, both duplex and rectangular styles. They shall be available in electrical ivory to match the raceway.

Acceptable Manufacturers

Panduit Corp.	JBX3510EI-A Deep Single Gang Box

3.4.3 DUAL SECTION SURFACE RACEWAY

a. The raceway shall be a two-piece design with a base and snap-on cover. The raceway shall maintain complete separation of the power and data channels. Total width shall be 4.07" by 1.77" deep with an approximate wall thickness of .10". The raceway base, cover, and divider shall be available in 8' and 10' lengths.

b. The base (T70B) shall have a 70mm opening, its own 70mm cover and features for mounting device brackets, hanging boxes, wire retainers and snap on faceplates. Divider walls, which snap onto the base to form additional wiring channels, must be available. The base shall be manufactured of rigid PVC compound. The base shall have a smooth texture, and be available in electrical ivory.

Acceptable Manufacturers

Panduit Corp.	T70BEI10	Base

c. The cover (T70C) shall have flanges for snapping onto the base. The cover shall be manufactured of a rigid PVC compound. The cover shall be available in electrical ivory. The cover shall match the finish and the color of the base.

Acceptable Manufacturers

Panduit Corp.	T70CEI10	Cover

d. The divider wall (T70DW) shall have flanges, which snap onto the T-70 base. The divider shall be manufactured of a rigid PVC compound. The divider shall have a smooth texture and be light gray in color.

Acceptable Manufacturers

Panduit Corp.	T70DWEI10	Divider Wall

3.4.3.1 FITTINGS

A full complement of fittings (T-70 series) must be available including but not limited to flat, internal, and external elbows, tees with inserts to separate power and data cabling, entrance fittings, cover couplers, base couplers, and end caps. A transition fitting shall be available to adapt to Panduit LDP10, LDP5 and LDP3 series raceways. The fittings shall provide a means for connecting to the raceway base and shall be capable of maintaining a 1" minimum cable bend radius. The fittings shall be manufactured from a rigid PVC (or ABS/PC) compound. The fittings shall have a matte texture and be available in electrical ivory to match the base and cover. They shall overlap the cover and base to hide uneven cuts. All fittings shall be supplied with a base where applicable to eliminate mitering.

Acceptable Manufacturers

Panduit Corp.	T70EEEI	Entrance Fitting
	T70ECEI	End Cap
	T70RAEI	Flat 90
	T70ICEI	Inside 90
	T70CCEI	Cover Clip
	T70BCEI	Base Clip

3.4.3.2 DEVICE BRACKETS

Device brackets and hanging boxes shall be available for mounting standard devices in-line within the raceway. An offset two-piece termination box shall be available for positioning power devices adjacent to inline data terminations. Faceplates may be a Pan-Way Snap-On faceplate to match and fit flush with the device bracket, or any NEMA standard 70mm faceplate. Data faceplates may accommodate up to six jacks and shall be modular in design to accept UTP, Coax, ST, SC, and Fiber-Jack type of connectors. They shall be available in electrical ivory to match the raceway base and cover.

Acceptable Manufacturers

Panduit Corp.	T70DB-X	Device Bracket
	T70HB-X	Hanging Box
	T70WCEI	Workstation Outlet

3.4.4 INSTALLATION

a. Work shall include furnishing all raceway and appropriate fittings and device plates to install a nonmetallic surface raceway system as indicated in these documents and in the specifications. Installer shall comply with detailed manufacturer's instruction sheets that accompany system components as well as system instruction sheets.

b. All surface raceway will be installed level and plumb. Any raceway that is not level or plumb will be replaced at no cost to the BCBOE. Any wall surface that is damaged due to the installation or repair of the surface raceway will be repair to the satisfaction of the BCBOE and at no cost.

c. The surface raceway will free of dents, dings, dirt, fingerprints, and any other imperfection.

d. The single section raceway will be mounted vertically from the ceiling to the outlet box.

e. The single section raceway shall be fastened three inches from the top and then at three-foot intervals. The Panduit LDW10-V installation tool shall be used to install the fasteners.

f. The boxes for the single section raceway shall be fasten with two fasteners.

g. The single section raceway shall have ceiling adaptors installed at the ceiling level to cover the transition from ceiling to wall. There shall also be a splice cover at each joint.

h. The dual section raceway shall be installed vertically down the wall to receptacle level. Then install the raceway horizontally twenty feet along the wall. The outlets will start about four foot from the vertical, then six feet apart, for three outlets.

i. The outlet sets shall be install with the T70WCEI workstation outlet with a T70HB-X hanging box on each side. Provide and install blank plates on all device boxes not used for the data outlets.

j. Anchor the dual section raceway three inches from each end and at intervals of three feet apart.

k. Install the entrance fitting at the ceiling to transfer the raceway from the ceiling to the wall. Install the base cover clips and cover clips to cover all joints.

l. Install the right angle fitting to transfer the raceway from vertical to horizontal plane.

m. Install the divider wall in the raceway for the placement of electrical wiring later, by others.

3.5 UTP BACK BONE CABLE

The copper UTP backbone will be a ***PLENUM*** rated category 6 cable. The cable will be installed from the MDF to each IDF.

Acceptable Manufacturers
Hitachi

3.6.2 J-HOOKS

The J-Hooks shall be made of flat galvanized sheet metal with the edges bent to prevent cable damage. The J-Hooks shall have mounting hole to allow mounting to the wall or beam clamps and the installation of ty-raps.

Acceptable Manufacturers

3.6.3 FIRE SLEEVES

All fire and smoke walls that are penetrated have sleeves placed thru them. The fire sleeves will be made of EMT conduit with bushings on each end. When any other wall has to be penetrated, it will also have these sleeves with out the fire stopping.

3.6.4 INSTALLATION

a. Work shall include furnishing all cable tray, j-hooks, sleeves, and appropriate fittings and device plates to install a complete pathway system as indicated in these documents and in the specifications. Installer shall comply with detailed manufacturer's instruction sheets that accompany system components as well as system instruction sheets.

b. All cable trays will be installed level and plumb. Any cable tray that is not level or plumb will be replaced at no cost to the BCBOE. Any wall surface or ceiling assemblies that are damaged due to the installation or repair of the surface raceway will be repair to the satisfaction of the BCBOE and at no cost.

c. The cable tray will be supported at intervals no greater than four feet.

d. All j-hooks will be installed at intervals no greater than four feet.

e. When a fire or smoke wall is penetrated use EMT conduit that extends at least two inches on each side of the wall.

g. Seal the void between the sleeve and the wall with rock wool and then cover with fire caulking.

h. Install plastic bushings on each side of the sleeve, all sleeves.

i. Seal the void between the sleeve and the cables with rock wool and then cover with fire caulking.

j. Do not install cable tray thru the any wall partitions instead use sleeves.

k. Any cable that is installed thru any wall with out a sleeve or a sleeve with out a bushing will be removed and replaced with another cable or cables.

3.7 MDF/IDF HARDWARE

Wiring closets that will be proposed in your RFP designated on the shop drawings as MDF, IDF-A & IDF-B, etc. Contractor will be required to install a wall mounted equipment cabinet / rack in each closet as directed below.

a. Cabinets will be of a standard design - with locking doors. Suitable for mounting in a classroom/lab environment without secure room. (A minimum

size of 4'X 25" will be used, and all cabinets will be sized by the equipment served plus a 25% growth factor.) There will be two-foot wall cabinets install in the modular classrooms.

Acceptable Manufacturer:
Generic

b. Racks will be seven foot Aluminum black finish. Use floor racks where MDF or IDF is in a secure area. With vertical wire managers proved solid covers on these managers. Mount Floor racks to the floor with at least ¼" Lead anchors. Mount all wall cabinets to ¾" plywood that is attached to the wall.

Acceptable Manufacturer:
Molex Premise Networks, INC. RAA-00002 Floor Rack
CMA-00001 BTR
CMA-00002 SOR

25.X16616 2U Vertical

Hubbell Premise INC.

c. Ladder racks will be eighteen inches wide, steel tubular construction. Use factory connectors and adaptors to mount the ladder rack to the floor rack and wall. Bond all the ladder rack to the ground bar installed in the closet.

Acceptable Manufacturer:
Hubbell Premise INC.

HLS1018B	Ladder Rack
HLMPK19B	Relay to ladder
HLX1518B	Wall Angle
HLTKB	Junction Kit
HLBSK	Butt Splice
HLVWBK	Vertical wall Bracket
HLX1518B	Wall Angle
HLTKB	Junction Kit

3.8 BACKBOARDS:

Backboards shall be three-quarter-inch thick B-D INT-DFPA plywood. When installed in a wire/tele closet, backboards shall be approx. 4'x 8' or made to fit the size of the wall area to be installed on (when installed in an office location, the backboard can be a minimum size to accommodate the equipment - voice/data blocks, electronics, etc. - that will be secured to it). Confer with the owner's Project Superintendent. The backboard shall be divided so that each zone (Voice, Data and Fiber) is separated and marked from one another.

3.9 GROUNDING and BONDING

a. Install a #6 AWG Bare Copper stranded conductor from the main electrical service ground to the 3"X6"X1/4" tapped ground bar located in the MDF of each site.

b. Install a #6 AWG Bare Copper stranded conductor from the 3"X6"X1/4" tapped ground bar located in the MDF to the 3"X6"X1/4" tapped ground bar in each IDF of each site.

c. Install the grounding conductor from the MDF to the IDF in the cable tray.

Bond each sections of the cable tray to the grounding conductor, on each side of the joining tray.

e. Bond all exposed metal equipment install in this RFP to the ground bar in each closet.

f. Bond the wall cabinets installed in the modular buildings to its electrical service ground.

g. Just running and tying a ground wire to the steel frame or conduits in the buildings will not be allowed. ***The only accepted way of grounding and bonding will be as described above.***

3.10 NETWORK SWITCH UNIT

a. The Network Switch Unit must be capable of supporting a minimum of 192 Switched Ethernet devices per chassis in a star configuration. The "Switch" must be "Stackable" to allow the user to add or replace a switch module without adding a "repeater" function and a minimum "Stackable" density of 16 switches. A device may be a node, another Switch, or a transceiver. The Network Switch Unit must offer network management capability.

b. The MDF will contain the main switch in the building with each other switch connected VIA 50/125um fiber optic cable back to it.

c. When the number of drops exceeds the capacity of the switch, another switch must be installed in the same closet, but it must be connected back to the Main MDF switch. There shall not be any copper connections between switches.

d. The minimum port density of the switches shall be forty-eight, these switches shall only be used in the modular classrooms.

Acceptable Manufacturer:

MDF & IDF Electronics	Cisco 4000 Series
	Cisco 3750 Series

3.13 UPS UNITS

a. The UPS units shall be of the ***SMART*** type, to allow connection and control thru the network.

b. The UPS unit for the Cisco switches shall be APC, in the MDF and The IDF.

c. Provide the SNMP WEB card for each UPS unit installed.

Acceptable Manufacturer:

APC

450

750

3.14 SURFACE CONDITIONS:

Coordinate the installation of items with the schedules for work of other trades to

prevent unnecessary delays in total work. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

3.15 EQUIPMENT INSTALLATION:

Install all equipment forming part of the work of this Section in complete accordance with the manufacturers recommendations and all pertinent codes and regulations.

3.16 CLEANING UP

a. On a daily basis remove all debris and excess materials, secure workspace and/or area.

b. Upon completion of all installation, thoroughly inspect all exposed portions of the installation and completely remove all exposed labels, soil, markings, and foreign materials.

E-Rate 2006 BID Comparison

	ANS		CSI	
Electronics	249,040.00		400,982.00	
BOE Switch	3,640.00			
Basic Maintenance	15,360.00		60,000.00	
Wireless LAN	131,575.00	(3 controllers)	105,971.84	(No controllers)
FirberNetwork	63,500.00		none	
SmartNet	7,300.00		25,109.58	
Cabling/Data drops	498,000.00		none	
	968,415.00		592,063.42	

2.11 BID AWARD

BCBOE will make the award of the year 2006 E-rate contract based on the criteria listed below.

Date: 2/10/2006

Vendor Submitting the BID: Computer Software Innovations, Inc.
1661 East Main Street
Easley, SC 29640

Factor	Weight	Rating %	
Price	30%	20%	
Prior experience	25%	10%	
Personnel qualifications	20%	20%	
Management capability	15%	15%	
Environmental objectives	10%	10%	
Total	100%	75%	

Comments: Bidded of electronics only

2.11 BID AWARD

BCBOE will make the award of the year 2006 E-rate contract based on the criteria listed below.

Date: 2/10/2006

Vendor Submitting the BID: Automated Network Systems
100 Industrial Park Rd.
Milledgeville, GA 31061

Factor	Weight	Rating %	
Price	30%	30%	
Prior experience	25%	25%	
Personnel qualifications	20%	20%	
Management capability	15%	15%	
Environmental objectives	10%	10%	
Total	100%	100%	

Comments: Bidded on electronics and cabling.